AMENDMENT

In The Claims

5   Please amend Claims 1,2,9,10 and 13 as follows:

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1.   (currently amended) An optical element ~~capable of~~ <u>operable for</u> performing nonlinear frequency conversion and amplitude modulation simultaneously, comprising a nonlinear optical crystal having an electrode-coated dispersion section in quasi-phase-matched (QPM)

10   sections for electrically controlling the relative phase among the mixing waves therein by applying an electric field thereto, whereby performing said nonlinear frequency conversion and amplitude modulation simultaneously.

2.   (currently amended) The optical element according to claim 1, wherein said nonlinear optical crystal is a material ~~capable of~~ <u>operable for</u> being made into quasi-phase-matched

15   (QPM) nonlinear optical ~~element~~ <u>elements</u>.

3.   (original) The optical element according to claim 2, wherein said nonlinear optical crystal is made of the material selected from a group consisting of $LiNbO_3$, $LiTaO_3$, $KTiOPO_4$, GaAs, and $RbTiOAsO_4$.

4.   (original) The optical element according to claim 3, wherein said electrode-coated dispersion

20   section is sandwiched between two quasi-phase-matched (QPM) sections.

5.   (original) The optical element according to claim 1, wherein said electrode-coated dispersion section is coated with conducting electrodes on two opposite surfaces thereof.

6.   (original) The optical element according to claim 1, wherein said nonlinear frequency conversion includes second harmonic generation (SHG), difference frequency generation

25   (DFG), sum frequency generation (SFG), optical parametric generation (OPG), optical parametric amplification (OPA), and optical parametric oscillation (OPO).

7. (original) The optical element according to claim 1, wherein said electrode-coated dispersion section is sandwiched between quasi-phase-matched nonlinear gratings, said nonlinear gratings have both the grating vectors parallel to the wave vector of said mixing waves, and said amplitude modulation is dynamically adjusted to the desirable modulation regime with a direct-current voltage offset on the said electrodes.

8. (original) The optical element according to claim 1, wherein said electrode-coated dispersion section is sandwiched between quasi-phase-matched nonlinear gratings, one of said nonlinear gratings has the grating vector parallel to the wave vector of said mixing waves, the other said nonlinear grating has the grating vector forming an angle with respect to the wave vector of said mixing waves, and said amplitude modulation is dynamically adjusted to the desirable modulation regime by laterally translating the nonlinear crystal with respect to stationary mixing waves.

9. (currently amended) A method for performing nonlinear frequency conversion and amplitude modulation, comprising the steps of:

fabricating providing a quasi-phase-matched (QPM) crystal with an embedded electrode-coated dispersion section; and

applying an electric field to said electrode-coated unpoled dispersion section for controlling the relative phase among the mixing waves in said dispersion section, whereby performing said nonlinear frequency conversion and amplitude modulation simultaneously.

10. (currently amended) An optical element capable of operable for performing nonlinear frequency conversion and amplitude modulation simultaneously, comprising a nonlinear optical crystal having multiple electrode-coated dispersion sections monolithically integrated in cascaded quasi-phase-matched (QPM) sections for electrically controlling the relative phase among the mixing waves therein by applying an electric field thereto, whereby performing said nonlinear frequency conversion and amplitude modulation simultaneously.

11. (original) The optical element according to claim 10, wherein each of said quasi-phase-matched (QPM) sections is the crystal section for performing one of the nonlinear optical processes, including second harmonic generation (SHG), difference frequency generation (DFG), sum frequency generation (SFG), optical parametric generation (OPG), optical

5   parametric amplification (OPA), and optical parametric oscillation (OPO).

12. (original) The optical element according to claim 10, wherein said nonlinear optical crystal comprises two electrode-coated dispersion sections interleaved in three quasi-phase-matched (QPM) sections for performing said nonlinear frequency conversion and amplitude modulation simultaneously.

10   13. (currently amended) An optical element ~~capable of~~ <u>operable for</u> performing nonlinear frequency conversion and amplitude modulation simultaneously, comprising:

a nonlinear optical crystal having at least one electrode-coated dispersion section integrated in cascaded quasi-phase-matched (QPM) sections for electrically controlling the relative phase among the mixing waves therein by applying an electric field thereto; and

15   a waveguide formed in said nonlinear optical crystal for guiding said mixing waves through said QPM sections and said dispersion section in said nonlinear optical crystal,

whereby performing said nonlinear frequency conversion and amplitude modulation simultaneously.

14. (original) The optical element according to claim 13, wherein said waveguide is fabricated

20   on the surface of the nonlinear optical crystal and said conducting electrodes are coated with conducting materials on the two sides of said waveguide, wherein the relative phase of said mixing waves is controlled by the applied electric field on said electrodes, thereby the wavelength converted output is amplitude modulated.